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GEOSCIENCE EXPLORATION NEEDS A TWO-FOLD BASE

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Geoscience Exploration Needs
A Two-Fold Base.

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The author was engaged in various phases of oil exploration from 1927 - 1947 in the Far East and Europe; and since he has been in contact with many geologists from Central Europe, who were in one way or the other connected with the exploration activities, which since 1950, have been going on in various continents.

In the following he outlines his opinion, that especially in areas where geoscience exploration has not yet resulted in a definite positive evaluation and where a broad local basis for working out field data along the most modern lines is not yet established, a double background for geosciences-exploration is desirable from an economical and also from a scientific point of view. One basis is formed by the field parties operating in areas, the evaluation and exploration of which is the aim of their activities. A second and equally important basis should be the laboratories preferably of the countries, from where the members of the field parties are recruited. Research work is essential on collected sample material, but this could be done only within the shpere of laboratory scientists, who have at hand personnel and equipment well versed in all the details and technicalities of modern and historical methods. The fact that firstly such laboratory units cannot easily be transferred without loss of capacity to far away locations, likewise secondly, the fact that moving such laboratory units would be very costly if the positive results of the exploration is not established and thirdly that laboratory units in their well based position in the home country could serve as backgrounds or home platforms to more than one exploration enterprise, makes it strongly advisable, to lay out geoscience explorations, at least in its early stages in such a way, that a carefully tuned interplay between field unit and home laboratory unit is secured.

Some remarks intended to substantiate the above ideas are submitted in the following.

Geological field work in the early years of this century consisted in "mapping" i.e. plotting on the plane table or in the sketch book what the observer has seen and measured; then, usually already on the spot, an idea could be given, whether an area seemed to be attractive. As practically no more such easily assessable structures are left, geology has to look today for possibilities mostly deep below the surface. A careful examination of surface samples as to its micro-content, mineral associations and other facts not easily established on the spot, is therefore necessary. Laboratories carrying out the break down of samples in a modern way started working in the thirties in areas, where production had been established on structures found by classical methods; such laboratories are of course missing in areas where so far no production exists.

Ore-exploration was formerly mapping and sampling of ore-seams; the interest was centered on those minerals, which were known to yield say Pb, Sn and which

in most cases could be identified on the spot. Elements today of interest as e.g. cadmium, germanium, indium are not to be traced by simple field or classic laboratory methods but require highly specialised laboratory techniques, e.g. spectrogrammetry, methods which certainly cannot be put into effective working under rough conditions.

Seismic work for subsurface exploration at first also used as a tool on the spot has become more and more specialized; its value as tool on the spot of course remains, but careful reinterpretations, sometimes several times over by workers independent of the locality, becomes an important additional possibility, which likewise should not be linked with field conditions.

Soil research today widens into micro-biology, geochemistry, local climatology, again of course starting from modern field observations; but these new sections are often beyond the realm of the field-worker or field-laboratory.

Examples to demonstrate similar tendencies of development could be added. They all point to two facts:

firstly, that there is a stage in geoscience exploration when the value of the prospect is not yet settled during which it does not seem advisable, to shift complicated laboratory methods too far into the zone of exploration; on the contrary in this case it seems advisable to use home laboratories as the basis for highly specialised laboratory-work;

secondly, that exploration work in far away countries, as usually carried out today, should be linked up more closely with "home methods" in order to obtain fully worked-out modern results. This of course, involves a consideration of the financial side, because, next to the costs of the field parties, the cost for additional costs in specialized home-laboratories should be considered as an essential component of any overall exploration budget.

It will of course, be necessary to take into account the specific aim of each exploration before deciding which sections of the laboratory work would have to be carried out on the spot and which of the more specialized work should be done "at home". No strict rules are recommended; but the aim should be that at a minimum cost a maximum amount of normal and highly specialized laboratory results should be put quickly at the disposal of the organising center of the field party.

The present highly developed methods of transportation will reduce the time factor, of course to be calculated by conveying samples from the field-staff to home-laboratory-staff with a minimum of risk, if plotted against the total time of the field-work and laboratory-work necessary.